EPA comments to the Phase I Site Characterization Data Summary Report
Columbia Falls Aluminum Company NPL Site
Columbia Falls, Montana
Prepared for Columbia Falls Aluminum Company, LLC by Roux Associates, Inc.
Dated February 27, 2017

General Comments – USEPA Comments in Black. CFAC/Roux Responses in Red.

1) Overall, the Phase I Site Characterization Data Summary Report (DSR) is well written and fairly comprehensive. The data collected during the first round of sampling will be invaluable in completing the site remedial investigation. The specific comments below are intended to provide clarification to how the DSR provides a description of the field sampling activities and data evaluation methodologies, as well as directions/suggestions on future site characterization activities.

   The summary of findings and conceptual site model presented in Section 4 makes several conclusive statements such as "These findings suggest that the Sanitary, Center and East Landfills are not contributing sources to the cyanide and fluoride in groundwater." It is premature to make such presumptions based on one round of sampling data, especially when that sampling occurred during seasonally low water table conditions. Similarly, it is premature to dismiss contaminants of potential concern (COPCs) from further evaluation, as discussed in the accompanying Screening Level Ecological Risk Assessment, until all four rounds of sampling specified in the Sampling and Analysis Plan (SAP) are completed.

   The entire Section 4.0 of the Data Summary Report is designed to summarize for the reader what the Phase I results are indicating in the context of the conceptual site model which will continue to be updated as the Remedial Investigation (RI) proceeds. It was not intended that any of the statements in Section 4.0 be taken as final conclusions of the RI. Where applicable, clarification will be provided to indicate that these are considered preliminary findings to be further evaluated based upon additional rounds of sampling, and where necessary, Phase II Site Characterization activities. Also, as stated in Section 4.1.5 of the draft Phase I Summary Report, "identification of which COPCs will be retained for further evaluation in the risk assessment process and included in the Phase II Site Characterization program will occur during development of the Baseline Risk Assessment Work Plan (BRAWP) and the Phase II Site Characterization SAP. Therefore, CFAC and Roux Associates agree that screening of COPCs from further evaluation will not be performed until all four rounds of sampling specified in the Phase I SAP are complete.

Specific Comments - USEPA Comments in Black. CFAC/Roux Responses in Red.

1) Section 1.1 (Page 1) – Site Boundary – Should this be referred to as the "Study Area" until the extent of contamination has been determined?

   The Site Boundary was defined in the Remedial Investigation/Feasibility Study (RI/FS) Work Plan and Administrative Order on Consent (AOC). CFAC/Roux Associates see no justification or benefit to changing how the Site Boundary is referenced in the Phase I Site Characterization Data Summary Report. CFAC understands that data collected during the RI/FS will continue to be evaluated to ensure that we adequately assess the extent of potential contamination.

2) Section 2.4.4.1 (Page 9) – Although the field methods used to collect soil gas samples were presented in the SAP Addendum, a brief description of the field methods should be included in this section.

Additional information regarding the field methods used to screen soil gas will be added to Sections 2.4.4.1 and 2.4.4.2 of the Phase I Site Characterization Data Summary Report.

3) Section 2.4 (Page 10) – Selection of drainage structures that were to be further evaluated – It is stated that "the three drainage structures with the highest concentrations of COPCs in soil, CFDS-005, CFDS-007, and CFDS-013, were selected for further investigation as part of the Phase I drilling Scope of Work to evaluate the subsurface soils beneath each structure". Why were only three selected? Would it be appropriate to evaluate more drainage structures in Phase II? What were COPC concentrations relative to screening levels? Which COPCs were the highest? More detail is needed in this section so that the rationale for further investigation, as well as whether more sampling is needed, is clear.

The Scope of Work for evaluating the drainage structures was discussed with USEPA during preparation of the RI/FS Work plan and was documented in Section 5.3.3 of the RI/FS Work Plan and Section 4.10 of the Phase I SAP. As stated in the RI/FS Work Plan, three drainage structures were selected to be drilling locations to characterize the soils beneath the structures in accordance with the plans.

The results of the drainage structure sampling are described in Section 3.4.3 of the Phase I Site Characterization Data Summary Report, and these data compared to screening levels are provided in Appendix L13 through L17. Section 3.4.3 includes a description of COPC concentrations relative to screening levels. As described in Section 3.4.3, in general, the conditions observed within and below the drainage structures are similar to soil conditions observed in the Site-wide soil samples collected across the Main Plant Area and Operational Area. This suggests that additional sampling to evaluate more drainage structures in Phase II is not necessary; however, this will be further evaluated in preparation of the Phase II SAP.

4) Section 2.6 (Page 11) – Please outline the drilling technique(s) used to minimize cross-contamination in the deeper monitoring wells and soil borings. Please also describe the criteria used to determine what material, grout and/or bentonite chips, was used to abandon soil borings.

The drilling techniques used to minimize cross-contamination in the deeper monitoring wells are described in Section 2.11.1 of the Phase I Data Summary Report.

The soil borings were abandoned with cement-bentonite grout. Bentonite chips were utilized sporadically in some cases to fill space after settling of the grout, but were not the primary method of abandoning soil borings.

5) Section 2.6 (Page 12) – Please add a brief description to the opportunistic sampling bullet list of where soil boring CFSB-131 was located with respect to prominent features. This has been provided for CFMW-028a.

A brief description of the opportunistic sampling locations will be added to the bulleted list in Section 2.6.

6) Section 2.7 (Page 14) – Description of ISM Sampling Methodology – The description of the sampling method performed for the first 15 DUs is not accurate. It is stated that "ISM field processing methods"

were used. The soil samples collected failed to comply with several key aspects of field collection and processing (e.g., field processing did not include drying and breaking up of soil aggregates, soil was mixed by hand allowing smaller particles to settle, subsamples were not collected in accordance with ITRC ISM guidance). All inadequacies should be outlined in the text. The current presentation downplays the method inconsistencies that occurred for the first 15 DUs.

The description of the ISM sampling methodology in Section 2.7 will be revised to not state that "ISM field processing methods" were used, as requested above. It will be noted that these samples were not collected in accordance with ITRC ISM guidance as requested in the comment.

7) Section 2.8 (Page 16) – Background Sample Collection Methodology – It is stated that boring grab samples were collected from the background area for comparison to site boring grab samples. How were samples that were collected using an ISM approach compared to those collected using a grab approach?

Samples collected using the ISM approach were not compared to those using a grab approach, as it is recognized that the two sampling methods are not comparable.

8) Section 2.11.1 (Page 18) – The text states that the screened intervals for deeper monitoring wells were "typically set below the first low-permeability unit observed during drilling". Please add a discussion of what criteria were used to construct deep well screens if this typical condition was not met.

Additional text will be added to Section 2.11.1 discussing the installation of deep monitoring well screens. The text will describe that in locations where a low permeability unit was not encountered, a spacing of 25 feet or greater was placed between the water table monitoring wells and the deeper wells. In locations where bedrock was encountered close to the water table, the deeper well was placed immediately above the bedrock.

9) Section 2.11.2 (Page 20) – Please list the monitoring wells that were equipped with pressure transducers, and describe the selection criteria used to determine which wells would be monitored by transducer.

Section 2.11.2 will be modified to note that monitoring wells CFMW-001, 003, 020, 044b, 049, and 056 were equipped with pressure transducers. Section 2.11.2 will also be modified to note that the monitoring wells equipped with pressure transducers were selected to evaluate conditions in various areas of the Site and around different Site features. It should be noted that pressure transducers were installed in April 2016, within existing monitoring wells (i.e., before the installation of any new monitoring wells), prior to any significant data collection at the Site. The pressure transducers will continue to be utilized throughout the RI to evaluate trends around the various Site features of interest.

10) Section 2.11.3 (Page 23) – Surface Water Collection Technique – It appears that a grab sample was collected without consideration of collection depth. Because concentrations may vary according to depth, as a result of groundwater interacting with surface water, a depth-integrated sampling technique is suggested for future sampling.

Depth was considered during sample collection. All samples were collected at a depth of approximately 60 percent of the total water column depth. This general rule of thumb allows for samples to target the area of the water column where concentrations and flow is generally consistent, while avoiding interferences with the surface and/or interactions from groundwater entering the from the bed of the surface water body. It is also noted at that the maximum water depth at any sampling location was approximately two feet, and with the exception of backwater seep sampling, all sample locations are generally in fast flowing water bodies in which mixing would rapidly occur. Based upon these two factors (generally shallow depth, and fast flowing) depth integrated sampling is not considered necessary to obtain a representative sample.

Four rounds of surface water data will be collected in accordance with the RI/FS Work Plan. After the completion of four sampling rounds, the data will be reviewed and evaluated in the Groundwater and Surface Water Summary Report to be submitted in late 2017. Based on the evaluation of the data, a more detailed depth-integrated sampling technique will be considered for future sampling as part of the Phase II Site investigation.

11) Section 2.13 (Page 26) – Corrective Actions for QA/QC Audit Findings – It is unclear if corrective actions were implemented to address the findings of the QA/QC audits. Were issues immediately addressed? Did field personnel require follow-up training regarding processes and procedures? It would be useful to have a discussion of whether issues result in a bias, and, if so, what is the direction and magnitude of this bias? It would be beneficial to expand the text to address this missing information.

The text in Section 2.13 will be expanded to note that no major corrective actions were needed throughout the field program. Where needed, the Quality Assurance (QA) Officer noted recommendations on the Quality Assurance/Quality Control (QA/QC) forms and notified field staff immediately. Examples of the minor adjustments that were implemented based on the findings will be added to the text in Section 2.13. There were no issues that resulted in any bias to the program results.

12) Section 2.14 (Page 26) – Data Verification and Validation Activities –What "data verification" procedures were completed? If appropriate, the nomenclature should be simplified to state that only data validation was performed.

Section 2.14 will be expanded to include a description of the verification procedures performed on project data to confirm that the data met all Data Quality Objectives outlined in the RI/FS Work Plan and Phase I SAP. A summary of the verification performed will be provided, including, but not limited to, data verification of field sample collection records, sample receipt, laboratory login, sample preparation, and data calculations.

13) 2.16 (Page 28) – SLERA Field Reconnaissance – While it is noted that a field reconnaissance effort was completed to support the SLERA, a brief synopsis of the findings of this field effort should be added.

A brief synopsis of the SLERA field reconnaissance findings will be added to Section 2.16, as requested. Additionally, the SLERA field reconnaissance is discussed in the SLERA Summary Report submitted separately to the USEPA on February 27, 2017.

14) Section 3.2.1 (Page 30) – VOC Soil Gas Screening Results Interpretation – It is stated that "only one detection of VOCs was above 1.0 ppm". Can the significance of this threshold of 1.0 ppm be included in the text? Also, it may be helpful to identify the locations were VOC detections were present and where they were absent to aid in interpretation of the data (e.g., The Sanitary Landfill, the West Landfill, and the Industrial landfill all had VOC detections in soil gas screening sampling. The West Scrubber Sludge Pond and the West Landfill Vent did not have any VOC detections in soil gas screening sampling.).

Reference to the 1.0 ppm as a threshold will be removed in the report text in Section 3.2.1 and the text will simply state the results. Text will be added as requested to help identify the locations where volatile organic compound (VOC) detections were present and where they were not detected.

15) Section 3.2.3.2 (Page 32) – Landfill GPR Survey Findings – The last bullet indicates areas that the GPR did not have any clear signals present. However, similar to the other bullets in this section, there are no conclusions drawn regarding this observation. Is it assumed that no cap is present? What do historical documents indicate?

Additional language will be added to the last bullet of Section 3.2.3.2 indicating that the lack of any clear, consistent signal in the landfill GPR survey results at the Wet Scrubber Sludge Pond, the Sanitary Landfill, and the Center Landfill is interpreted to indicate that no consistent, well-defined landfill cap is present across these areas. CFAC/Roux Associates does not have any historical documents for the Wet Scrubber Sludge Pond or the Sanitary Landfill which would suggest a cap is present. However, CFAC does have historical drawings which suggest a "6" clay seal" was part of the design for construction of the Center Landfill.

16) Section 3.3.1; Cross-Sections – It would be beneficial to the user if the stratigraphic descriptions in the text and on the cross-sections directly correlated. For example, the legend on the cross-sections should show that the uppermost unit (fine to coarse sand…) comprises the 'Glacial Outwash and Alluvium' stratigraphic section, while the units between the outwash and bedrock comprise the 'Glacial Till' section, and so on.

The cross sections will be modified as requested to better correlate with the stratigraphic descriptions in Section 3.3.1.

17) Sections 3.3.2 and 3.3.2.1 – The description of the aquifer contained within the upper hydrogeologic unit (outwash deposits) as 'perched' needs to be further supported in the text of Section 3.3.2. A perched aquifer is the result of a discontinuous aquitard or series of aquitards occurring in the unsaturated zone above the water table upon which infiltrating water mounds. This results in groundwater 'perching' above and flowing down into the generally recognized water table aquifer. Upon review of the cross-sections and potentiometric surface maps, it appears that the upper hydrogeologic unit aquifer is continuous across the site, and that fine-grained material in the lower hydrogeologic unit (till) may act as an aquitard, as evidenced by the observation of dry soil beneath saturated outwash. It is noted in Section 3.3.2.1 that groundwater elevations in the lower hydrogeologic unit wells are below the groundwater elevations in paired upper hydrogeologic unit wells, implying that a downward vertical gradient exists, and offering support to the definition of the upper hydrogeologic unit as a perched aquifer. To add clarity to this discussion, please combine these sections and use the groundwater elevation data to support the hydrogeologic model. Also, future

investigation activities should include aquifer pumping tests at wells completed in both the upper and lower hydrogeologic zones to estimate aquifer characteristics including transmissivity, interconnectivity within and between zones, and any existing boundary conditions.

Perched zones have been documented to occur at various locations throughout the Kalispell Valley and have historically been referred to in regional literature as the Pleistocene perched aquifers (Konizeski et al., 1968). While the upper hydrogeologic unit appears to be continuous across the Site, its lithology, and rapid and pronounced response to precipitation/seasonal changes is consistent with the "perched aquifers" described by Konizeski. Additionally, as noted in the comment, the groundwater elevations imply that a downward vertical gradient exists. Moreover, the dry conditions were typically observed in the upper portions of the lower hydrogeologic unit. These aspects of the hydrogeologic model suggest the upper unit is behaving as a perched aquifer. As requested in the comment, Sections 3.3.2 and 3.3.2.1 will be combined and revised, including use of the groundwater elevations to support the hydrogeologic model.

At this time, CFAC/Roux Associates does not believe that aquifer pumping tests would provide significantly more value to the hydrogeologic model. The data generated during the Phase I Site Characterization (i.e., water level data, transducer data, contaminant data, etc.) all suggest limited connection between the upper hydrogeologic unit and the underlying till. CFAC/Roux Associates are proposing to conduct pneumatic slug tests during the Summer of 2017. The pneumatic slug tests will enable estimation of aquifer parameters such as hydraulic conductivity and transmissivity at numerous locations across the Site in both the upper hydrogeologic unit and below the upper hydrogeologic unit. These data will in turn will be useful in understanding and evaluating groundwater flow and contaminant migration. Aquifer pumping tests will be considered in the future if they are determined to be needed to achieve specific RI/FS objectives.

18) Section 3.3.2.1 (Page 38, last paragraph, 1st sentence) – Please revise the sentence as follows: "The ~~potentiometric surfaces~~ **groundwater elevations** measured in…"

The sentence in Section 3.3.2.1 will be revised as noted.

19) Section 3.3.2.2 – Please add a discussion of which wells were equipped with pressure transducers including which hydrogeologic unit each is completed in, and the rationale for the choice.

Section 3.3.2.2 will be modified to note that monitoring wells equipped with pressure transducers included CFMW-001, 003, 020, 044b, and 049 (screened in the upper hydrogeologic unit) and CFMW-044b and 056 (screened below the upper hydrogeologic unit). Section 3.3.2.2 will also be modified to discuss that monitoring wells equipped with pressure transducers were selected to evaluate conditions in various areas of the Site and around different Site features, at the start of the field program. Pressure transducers were installed in April 2016, within existing monitoring wells (i.e., prior to the installation of any new monitoring wells). It should be noted that the pressure transducers will continue to be utilized throughout the RI to evaluate trends around the various Site features of interest.

20) Section 3.4 (Page 43) – Soil Quality – The last sentence of the paragraph states that "further evaluation of that particular analyte and exposure scenario <u>may</u> be warranted during the risk assessment phase of the RI/FS". In what situation would further evaluation not be warranted? Can this statement (and all similar statements in the report) be strengthened to state that further

evaluation is warranted? Also, can this paragraph be clarified to state that analytical results are being compared to the most conservative screening criteria? The utility of having a variety of screening value sources is lost if the most conservative screening value for each chemical for each exposure media is not used. It should also be clarified that only human health screening values are being presented.

The statement referenced in Section 3.4 will be revised as requested, and all similar statements in the report will also be revised. The paragraph in Section 3.4 will also be revised to state that analytical results are being compared to the most conservative screening criteria. It will also be noted that only human health screening criteria are being presented in the Phase I Site Characterization Data Summary Report.

21) Section 3.4.1 (Page 44) - Please indicate that the target risk level for cancer is 1E-06 and for non-cancer the target hazard quotient is 0.1 for the screening values.

Section 3.4.1. will be revised to indicate that the target risk level for cancer is 1E-06 and for non-cancer the target hazard quotient is 0.1 for the screening values.

22) Section 3.4.1 (Page 45) – Statistical Summary of Analytical Results (for soil) – This statistical summary should evaluate the adequacy of the detection limits achieved relative to the screening values. This is a global comment for the document.

An evaluation of method detection limits for all media will be added to the report in Section 3.8, following the summary of all results. The method detection limit evaluation will include a table with minimum, maximum, mean, and median detection limits compared to all screening criteria evaluated in the Phase I Data Summary Report.

23) Section 3.4.1 (Page 45) – Statistical Summary of Analytical Results (for soil) – The treatment of non-detects has not been noted in the text. Please clarify how statistics were computed in cases where a portion of the analytical results for an individual chemical were non-detect.

In cases where a portion of the analytical results for an individual chemical were non-detect, the non-detects were treated as a value of zero when computing the statistics in the summary tables.

24) Section 3.4.1 (Page 45) – Statistical Summary of Analytical Results (for soil) – There is a lack of discussion of analytical results relative to the USEPA Protection of Groundwater Risk-Based Soil Screening Levels in this entire section. Discussion is focused on the USEPA Industrial and Residential RSLs which are not the most conservative values.

Section 3.4.1 will be modified to add additional discussion about the analytical results relative to the USEPA Protection of Groundwater Risk-Based Soil Screening Levels.

25) Section 3.4.2.4 (Page 55) – Comparison of Field vs. Lab Processing of Incremental Soil Samples – In the introductory paragraph for this section it is stated that resampling occurred to allow for "comparison of the results from the two methods (field processing vs. laboratory processing), and for assessment of whether or not the initial field processing approach could have resulted in either a low or high bias relative to the laboratory processing methods". The evaluation of this bias is not presented in the text. Rather, an evaluation of the results is performed relative to screening levels to decide if re-sampling is warranted. It does not investigate the apparent variability between results

for the samples as an indicator for re-sampling. The variability between the samples is important because future nature and extent of contamination evaluations would rely upon having data that are of high quality. In addition, risk calculations will also require reliable estimates of chemical concentrations in soil. If the need to resample is dismissed because an area was found to exceed screening values using either the field- or laboratory- processed sample, future risk estimates for these areas will be biased unless adjusted. Because it is unknown what the proper adjustment factor would be because results are highly variable, re-sampling of areas with highly variable analytical results (an RPD greater than 35% for field vs. laboratory processed samples) should be performed. The current conclusions, which are based on results adjusted by the maximum RPD plus 10%, should be removed. It is unclear how this adjustment strategy was developed. Can it be demonstrated that this adjustment properly considers the variability in the data?

Of importance to note, and as discussed during the comment period of the RI/FS workplan, there is additional source of error to consider for the ISM samples that were processed correctly. Per ITRC guidance, for any ISM sample, the reported concentration will underestimate the true mean about half of the time due to inherent sampling variability and analytical uncertainty. However, because only one ISM replicate was collected, there is no way to account for this source of error (i.e., it is not possible to compute upper concentration limits for a single sample).

The future utility of the field processed samples should be discussed in the report. There is likely little utility given that the field processing impacted concentrations and results were biased low by such a large fraction.

If retained in its current format, the note in Appendix M regarding highlighted cells should be revised to indicate that cells are highlighted if the original sample (with field processing) was below the lowest screening level and the second sample (with laboratory processing) is above the lowest screening level.

The adjustment strategy used to evaluate the data was developed by CDM Smith and USEPA, and it was specifically requested in comments provided by CDM Smith on the Phase I SAP Modification #4 (included in Appendix I of the Phase I Data Summary Report). Section 3.4.2.4 notes that the evaluation was completed in accordance with instructions from USEPA.

Appendix M summarizes the evaluation that was requested by the USEPA / CDM Smith. However, the potential variability described in the comment above is acknowledged. Therefore, CFAC is willing to resample all 12 grids for all analytes during the Phase II investigation. Additionally, during the resampling, CFAC will complete two additional replicate samples, allowing for the future calculation of upper concentration limits as needed.

Section 3.4.24. will be modified to discuss the future resampling.

26) Section 3.4.4 (Page 57) – Please add to the section a discussion of the potential source(s) of cyanide, fluoride, and SVOCs in background soil.

As noted in Section 3.4.4.4 and as specified in the preliminary conceptual Site model within the RI/FS Work Plan, cyanide, fluoride, and SVOCs were presumed to be primary COPCs at the Site based upon knowledge of historical Site operations and the results of prior investigations. This presumption has been further confirmed based upon the concentrations of these COPCs detected in soil within Site features at various locations across the Site; as well as, in the case of cyanide and fluoride, in groundwater as described in Section 3.5. Therefore, cyanide, fluoride and PAHs were intentionally not included in the statistical evaluation of the Background Area soil quality for this Data Summary Report.

It is recognized that these analytes were detected in the Background Area. The detected concentrations in the Background Area are typically low (below USEPA Residential RSLs). It should be noted that literature indicates that cyanide, fluoride and PAHs can be found as naturally occurring substances within the environment. It is therefore difficult to make conclusions regarding the potential source(s) of cyanide, fluoride, and PAHs in the Background Area this time. It is recognized that the current data set cannot be used to distinguish levels in the Background Area from being Site-related or naturally occurring; however, as noted above, it is understood that these analytes will remain COPCs moving forward.

27) Section 3.4.4 (Page 61) – Background Soil Evaluation – The utility of evaluating the background data using BTVs and UTLs is acknowledged, however, because additional evaluation methods are being considered, it would also be appropriate to perform a comparison of the background and site soil borings using hypothesis testing. This type of comparison can also be made using ProUCL to determine if two datasets are statistically significantly different from one another.

    Although hypothesis testing could be performed, the reliability of the test statistics and therefore the conclusions derived would be questionable. The data sets for the background populations are all small (eight per depth interval), and of these, many are often non-detects. As stated in the ProUCL Version 5.0.00 User Guide, it is preferable to use hypothesis testing if, and only if, there are at least 10 observations from each population (more observations are preferred). In addition, in conducting the hypothesis testing, one would not want to group the data from areas known to be impacted from Site operations with the data from borings collected from areas remote from historical operations. Dividing up the soil data into subareas for statistical evaluation was not deemed necessary for the Phase I Data Summary Report, as the visual comparison of the concentrations at individual locations to the various background statistics in Appendix R provides a good visual representation of locations exceeding the Site-specific background values for metals. The need or utility of performing hypothesis testing will be evaluated further during preparation of the Baseline Human Health and Ecological Risk Assessment Work Plans.

28) Section 3.4.5 (Page 64) – Borrow Pit Soil Comparison to Background – Similar to the comment above, the evaluation could be enhanced through the inclusion of hypothesis testing. Also, please clarify the depth of borrow pit soil and background soil that were compared.

    Similar to the reasoning stated in the response above, hypothesis testing against the borrow pit soil is not preferable due to small data sets (seven samples per depth). At each borrow pit location, samples were collected at the surface (0 to 0.5 ft-bls) and at two intermediate depths (2 to 4 ft-bls and 10-12 ft-bls). For clarification, the mean of all intermediate-depth borrow pit samples (intervals 2 to 4 ft-bls and 10-12 ft-bls) was compared with the mean of all background area samples collected from both 0.5 to 2 ft-bls and 10 to 12 ft-bls intervals.

29) Section 3.5.2 (Page 68) – Please include a discussion of how high pH from grout infiltrating well screens may or may not affect groundwater analytical results.

A discussion of how high pH from grout infiltrating well screens may or may not affect groundwater analytical results will be included in the Groundwater Data Summary Report to be submitted to USEPA and MDEQ after all four rounds of sampling are completed. A plan to further address the monitoring wells will be developed, if needed, in the Phase II SAP.

30) Section 3.5.2 (Page 69) – Groundwater Screening Values – The text does not list all screening values that are presented in the accompanying tables. "CFMW-001 Standard" is listed in the tables, but not the text. Please add and clarify the basis of this source. In addition, the EPA Tapwater RSL is not included in the discussion in the text. Please add.

Section 3.5.2 will be modified to note that in addition to the human health screening criteria, the statistical summary tables provide the frequency that the measured concentration of each analyte in groundwater exceeded the concentration measured in monitoring well CFMW-001, which was identified in the Phase I SAP as a background monitoring well location.

See the response to the next comment regarding the USEPA Tapwater RSLs.

31) Section 3.5.2 (Page 70) - Discussion of USEPA Tapwater RSLs – This discussion needs to be modified to remove discussion of the conservative nature of the USEPA Tapwater RSL. It is acknowledged that the MCL is greater that the USEPA Tapwater RSLs, however, MCL values are often not risk-based and are derived with financial consideration of implementation. A detected value above the USEPA Tapwater RSL means that the detection limits are adequate to perform this evaluation, not that the value is overly conservative. Moreover, because a human health risk assessment is going to be performed for the Site, it is premature to dismiss or reduce the utility of the USEPA Tapwater RSLs in this document. These values should be included throughout, and in conjunction with, the initial discussion of the groundwater statistics. By isolating the discussion (i.e., presenting it second), it implies that these are not worthwhile values, when in fact they are much more relevant than the MCLs to human health risk. This is a global comment and applies to the surface water evaluation (Page 75).

Section 3.5.2 will be revised to incorporate the discussion of the USEPA Tapwater RSLs throughout the discussion of the groundwater statistics. A similar revision will be completed in Section 3.6.2, which provides a discussion of the surface water data.

32) Section 3.5.2 (Page 70) – Chemicals Selected for Review in Groundwater – All chemicals for which analytical data are available should be compared to screening levels, rather than only evaluating those chemicals that have exceedances of screening levels in soil. The risk assessment will need to evaluate total risk at the Site, not just a portion. Parsing the evaluation in this manner may be appropriate in the uncertainty discussion, which will be presented in the future risk assessment. It is not appropriate to limit the scope of the evaluation of groundwater data at this time.

All chemicals that were sampled in groundwater were compared to screening levels in the tables within Appendix T. Additionally, statistics were calculated on all groundwater chemicals in Tables 21 and 22. A general discussion of all chemicals was provided in the summary section at the front of Section 3.5.2. It is understood that the risk assessment will need to evaluate total risk at the Site. The scope of the groundwater evaluation is not being limited at this time.

33) Section 3.5.2 (Page 70) – VISL Calculations – The groundwater concentration for benzene is 0.0E+00 µg/L as presented in Appendix U. Please confirm this is correct. The target HQ used in the VISL calculator appears to be 1. In order to consider the cumulative effects of chemicals, for screening purposes this should be 0.1. Please clarify what the basis is for the "Site Groundwater Concentration". Is this the maximum concentration for each chemical?

The maximum concentrations of each VOC detected in groundwater within the upper hydrogeologic unit were used as the basis for the Site groundwater concentrations used in the VISL calculator. Benzene was not detected in any groundwater samples from monitoring wells screened in the Upper Hydrogeologic Unit, and therefore the concentration of 0.0E+00 µg/L for benzene presented in the VISL calculator was correct.

The VISL will be revised to utilize a target HQ of 0.1.

34) Section 3.5.2.3 (Page 73) – Please present general chemistry data for all wells in trilinear plots (Piper diagrams) and Stiff diagrams to facilitate evaluation of hydraulic flow and connectivity in the hydrogeologic regime. This is a global comment and applies to the surface water evaluation (Page 77).

General chemistry data in groundwater and surface water will be plotted in Piper diagrams and/or Stiff diagrams to facilitate evaluation of hydraulic flow and connectivity in the hydrogeologic regime. Additional text will be added to Section 3.5.2.3 as warranted once the plotted data is evaluated.

35) Section 3.6.2 (Page 75) – Evaluation of Surface Water Data – This discussion and presentation in tables/figures/plates should also include a comparison of surface water results to the USEPA Tapwater RSLs. It should be clarified if total and/or dissolved results were used in the comparison and the rationale for doing so.

Section 3.6.2 and corresponding tables, figures, and plates will be modified to include a comparison of surface water results to USEPA Tapwater RSLs.

Surface water samples were only analyzed for "total" analysis. During preparation of the RI/FS Work Plan, CFAC/Roux Associates proposed analyzing all groundwater and surface water samples for both "total" and "dissolved" metals. However, based on discussions between the project team (USEPA, MDEQ, CDM Smith, CFAC and Roux Associates), it was agreed that CFAC should only sample for "total" analysis in surface water samples.

Based upon the consensus discussion of the CFAC and EPA risk assessment personnel at the meeting on April 19, 2017, it is proposed that both "total" and "dissolved" analysis will be completed for metals, cyanide, and fluoride analysis during the Round 4 sampling event and summarized in the Groundwater and Surface Water Data Summary Report planned to be submitted in late 2017, following the Round 4 sampling event.

36) Section 3.6.2 (Page 76) – Inclusion of MDEQ Circular DEQ-7 Values – It is confusing why the chronic and acute Aquatic Life Numeric Water Quality Standard values have been included when it is consistently stated throughout the document up until this point that any and all ecological evaluation will be presented in the SLERA. A consistent presentation of this type of information across media types is preferred.

Section 3.6.2 will be modified to remove the language referencing the Aquatic Life Numeric Water Quality Standard values. Additionally, the Aquatic Life Numeric Water Quality Standard values will be removed from the maps in the appendices. All ecological evaluation will be completed in the SLERA and future ecological risk assessment documents.

37) Section 3.7 (Page 77) – Sediment Quality – There is mention of surface water data in the first paragraph, it is suggested that this paragraph is revised as appropriate.

Section 3.7 will be revised to remove mention of surface water in the sediment discussion.

38) Section 3.8 (Page 80) – Laboratory Data Validation – It would be helpful to include a more detailed synopsis of the data validation. Currently, rejected samples and analytes are detailed in a list of bulleted items. It would be helpful for the reader if there was a summary of this information beyond the approximate 0.1% overall rejection rate. Are there chemicals that consistently had analytical/sampling issues in certain media? Are there any trends that can be identified? This information would be helpful in moving forward with sample collection and analysis as well as help identify any potential data gaps that may have arisen due to consistent rejection of results (if applicable).

Section 3.8 will be expanded to include the validation procedures performed on project data to confirm that the data met all Data Quality Objectives outlined in the RI/FS Work Plan and Phase I SAP. The expanded discussion will include a discussion of trends or gaps in data that may have arisen due to validation results, if any.

39) Section 4.1.1 (Page 84); Plates 15 and 16 – The text states that the origin of cyanide and fluoride in groundwater is centered at the Wet Scrubber Sludge Pond. While it is apparent that the highest concentrations of cyanide and fluoride are found in this area, it is important to note that elevated concentrations of these analytes are present elsewhere and decreased concentrations downgradient of the highest concentration wells are bracketed by increased concentrations further downgradient, suggesting multiple source areas. For example, on Plate 15 (cyanide in groundwater), an estimated concentration of 961J micrograms per liter (μg/L) is found in well CFMW-019. Directly downgradient of CFMW-019, well CFMW-028 shows a concentration of 104 μg/L, while downgradient of CFMW-028, well CFMW-034 is shown with a concentration of 327 μg/L. Please add a discussion of this nature to the section, and modify isoconcentration contours on Plates 15 and 16 to better present this scenario.

Cyanide concentrations observed during Round 1 of groundwater sampling near the West Landfill / Wet Scrubber Sludge Pond/ Drum Storage area are orders of magnitude higher than the locations downgradient. CFAC/Roux Associates feel this data preliminarily indicates that the landfills are the primary source. The variability of the concentrations in the center of the Site is acknowledged. These variations could potentially be related to groundwater flow direction, hydrogeology, and/or interaction of groundwater with nearby surface water features (i.e., the North-East Percolation Pond). Section 4.1.1 will be modified to discuss this variability. CFAC/Roux Associates will also continue to evaluate the iso-concentrations as additional rounds of data are collected. Additional evaluation of potential sources will be provided in the Groundwater Data Summary Report to be submitted after four rounds of sampling is completed.

40) Section 4.1.1 (Page 85) – Landfills Results Compared to Background – There is a statement regarding comparability of groundwater concentrations to background that is ultimately used to dismiss the Sanitary, Center, and East Landfills as contributing sources to cyanide and fluoride in groundwater. A rigorous statistical comparison of an adequate dataset should be performed prior to making such conclusions. Simply stating that two values (2.9 µg/L and 2.4 µg/L) are similar is not an adequate evaluation and the conclusion to dismiss these areas is premature.

A rigorous statistical evaluation is not needed to make the general statement as indicated in Section 4.1.1. CFAC believes the data does suggest what is indicated in the general statement. There is no definitive conclusion reached and stated in the report, and the Sanitary, Center and East Landfills are not being "dismissed" from further evaluation. This statement, and the entire Section 4.0 of the Data Summary Report, is designed to inform the reader of what the Phase I results are indicating about general conditions at the Site. COPCs are not being eliminated and Site features are not being dismissed from further investigation based on the discussion in Section 4.0. It is acknowledged that additional data may be required prior to making any definitive conclusions. CFAC will start by evaluating all four rounds of groundwater data at the end of 2017. Additional data gaps and requirements will be developed and discussed in the Phase II SAP.

41) Section 4.1.1 (Page 85-86) – Landfills as a Contributing Source of COPCs to Soil – Again, a rigorous statistical evaluation would be necessary to properly draw conclusions regarding the impacts landfills have on the surrounding soil. In addition, the mobility of COPCs should be considered rather than visual comparison of vegetation. The lack of visible plant toxicity is not necessarily an indicator of other ecological or human health toxicity.

Similar to the response provided to the prior comment, CFAC and Roux Associates believe a rigorous statistical evaluation is not needed to make the general statements as indicated in Section 4.1.1. CFAC believes the data does suggest what is indicated in the general statement. There is no definitive conclusion reached and stated in the report. This statement, and the entire Section 4.0 of the Data Summary Report, is designed to give a reader a general idea of the conditions at the Site. CFAC and Roux Associates will consider these comments in developing Baseline Risk Assessment Work Plans and the Phase II SAP.

42) Section 4.1.2, 4.1.3 (Page 86) – Former Drum Storage Area as a Source Area, Percolation Ponds – Levels of chemicals in soil should also be compared to the USEPA Protection of Groundwater Risk-Based Soil Screening Levels.

Sections 4.1.2 and 4.1.3 (and Section 4.0 in its entirety) were designed to give a reader a general idea of the conditions at the Site. Final selection/retention of COPCs is not being completed in these sections. The text in these sections recognize that the Former Drum Storage Area and Percolation Ponds contain some of the highest concentrations of COPCs in soil. Adding a discussion of USEPA Protection of Groundwater Risk-Based Soil Screening Levels to these sections do not add any additional value at this time.

As discussed throughout these response to comments, more discussion of the USEPA Protection of Groundwater Risk-Based Soil Screening Levels will be added throughout Section 3.0 and in thematic plates.

43) Conclusive statements regarding concentrations being higher or lower should be statistically derived or the statements should be removed (see last sentence in Section 4.1.3).

A statistical evaluation is not needed to make the general statement as indicated in Section 4.1.3. Please refer to maps in Appendix N and tables in Appendix L which indicate that concentrations are higher in the Northeast Percolation Pond as compared to South Percolation Ponds. This statement and the whole section is designed to give a reader a general idea of the conditions at the Site. COPCs are not being eliminated based on this evaluation. It is recognized that statistics may be required in the future.

44) Section 4.1.4 (Page 88) – For completeness, text should be revised to include discussion of levels of chemicals in soil relative to the USEPA Protection of Groundwater Risk-Based Soil Screening Levels for the protection of groundwater rather than just including a discussion of USEPA Residential and Industrial soil RSLs.

Similar to the response to the comment above on Sections 4.1.2 and 4.1.3, Section 4.14 was designed to give a reader a general idea of the conditions at the Site. The text in these sections generally recognize the presence of COPCs (cyanide, fluoride, and PAHs) in soil around the Main Plant Area. Where appropriate, text will be added to discuss the USEPA Protection of Groundwater Risk-Based Soil Screening Levels. However, the primary discussion of the USEPA Protection of Groundwater Risk-Based Soil Screening Levels will be added to Section 3.0 and thematic plates.

45) Section 4.1.5.3 (Page 90) – Pesticides and PCBs – Please expand this section to include discussion of detection limit adequacy. These compounds are being dismissed as being potential COPCs for some locations because the samples collected in these areas were all non-detect. It should be confirmed and presented in this section if achieved detection limits resulted in data adequate for comparison to the most stringent screening levels. Additionally, focus is being placed on three DUs in the operational area for future sampling due to detections of PCBs. Can it be confirmed that other DUs should not be included when taking into account the field processing techniques that were employed and the resulting variability around those results?

Additional discussion will be added to Section 4.1.5.3 regarding detection limit adequacy and the section will be modified as necessary.

As noted in the responses above regarding the ISM field processing, the 12 DUs where field processing occurred will be resampled. PCB results from the resampling in the 12 DUs will be evaluated in addition to the three DUs noted in the section.

46) Section 4.1.5.4 (Page 91) – Dioxins and Dibenzofurans - For completeness, text should be revised to include discussion of levels in soil relative to the USEPA Protection of Groundwater Risk-Based Soil Screening Levels rather than just including a discussion of USEPA Residential and Industrial soil RSLs.

Similar to the response to the comments above on Sections 4.1.2, 4.1.3, and 4.1.4, Section 4.1.5.4 was designed to give a reader a general idea of the conditions at the Site. The text in these sections generally describe the conditions of the Rectifier Yards. Where appropriate, text will be added to discuss the USEPA Protection of Groundwater Risk-Based Soil Screening Levels. However, the primary discussion of the USEPA Protection of Groundwater Risk-Based Soil Screening Levels will be added to Section 3.0 and thematic plates.

47) Section 4.2.1 (Page 90), 2nd paragraph, 1st sentence – Cyanide and Fluoride Concentrations in Groundwater – Please revise this sentence to state, "…~~elevated~~ **the highest observed** concentrations of cyanide and fluoride **in groundwater** appear to be ~~present within groundwater that originates in the~~ **centered in monitoring wells adjacent to the** West Landfill/Wet Scrubber Sludge Pond area**. Impacted groundwater in this area appears to** generally migrate~~s~~ southward, in the upper hydrogeologic unit, towards the Flathead River," (emphasis added).

Section 4.2.1 will be revised as requested.

48) Section 4.2.1 (Page 92) – Cyanide and Fluoride Concentrations in Groundwater – Conclusions based on the comparison of analytical results for cyanide and fluoride to the MCL should be revised to be presented based on a comparison to the EPA Tapwater RSL. Also, please remove the statement in the 2nd full paragraph on the page dismissing the existence of secondary sources (see comment regarding page 84 and Plates 15 and 16 above).

Section 4.0 in its entirety was designed to give the reader a general idea of the conditions at the Site. The text in this section will be expanded to also include a discussion of the USEPA Tapwater RSLs. However, CFAC/Roux Associates believe there is also value in discussing the data relative to the USEPA MCLs, as it provides further context to the discussion/conditions. As noted in previous responses, potential COPCs are not being removed based on the analysis provided in this section.

As described in the response to the comment above regarding Plate 15 and 16 (Section 4.1.1.), concentrations of cyanide and fluoride observed during Round 1 of groundwater sampling near the West Landfill / Wet Scrubber Sludge Pond/ Drum Storage area are orders of magnitude higher than the locations downgradient.. CFAC/Roux Associates believe that the Round 1 sampling data preliminarily indicate that the historical landfills are the primary source of cyanide and fluoride. The language referenced regarding secondary sources will be modified to be less definitive about secondary sources, and will note that the assessment is preliminary. Further assessment of sources will be completed as more data is collected (i.e., after four rounds of sampling and during the Phase II Site investigation.

49) Section 4.2.1 (Page 93) – PAHs in Groundwater - Please expand this section to include discussion of detection limit adequacy. Please clarify the sentence "the complete absence of PAHs in groundwater despite the widespread exceedances of the Groundwater RSLs is reflective of the conservative nature of the RSLs". How is it possible that PAHs are completely absent, yet there are widespread exceedances of the Groundwater RSLs? Also, how can there be widespread exceedances of the Groundwater RSLs and the inclusion of the following statement "These findings indicate that the PAHs observed in soil are not impacting groundwater quality"? Please revise the text accordingly.

Section 4.2.1 will be modified to include a discussion of detection limit adequacy. Additionally, it will be clarified that there were widespread exceedances of the Protection of Groundwater Risk-Based Soil Screening Levels, but there were no detections of PAHs in groundwater.

50) Section 4.2.2 (Page 94) – Cyanide in Surface Water (seep area, Flathead River, etc.) – The text states that all samples were non-detect or below all screening levels for cyanide and further conclusions

are then drawn. Inspection of Table W3 reveals that even the MCL (the least conservative screening level) was exceeded for the seep areas and that the detection limits were inadequate for evaluation of non-detects versus screening levels. Please confirm these are the data being referenced or clarify the correct data source. If these are the correct data that are being referenced, please correct the text to reflect this information.

The text in Section 4.2.2 referenced above was referring to samples located in the main channel of the Flathead River (i.e., not the Backwater Seep Sampling Area). The text and data will be reevaluated and the text will be revised for further clarification.

51) Section 4.2.2 – (Page 95) – Evaluation of Sediment Analytical Results – It is stated that "evaluation of the sediment sampling results from these areas will be provided in the SLERA". However, in the RI/FS Work Plan, it is stated that sediment data will be compared to EPA Residential RSLs.

Additional information will be added to Section 4.2.2 discussing sediment data relative to the USEPA Residential RSLs. Comparison to ecological criteria will occur in the SLERA.

52) Section 4.2.3 (Page 96) – Soil Vapor – Similar to the selection of other screening values, chemicals that exceed a hazard quotient of 0.1 should be retained as COPCs to take into account potential cumulative risk.

As described in the response to the prior comment regarding Section 3.5.2, the VISL will be revised to utilize a target HQ of 0.1. By utilizing a target HQ of 0.1, the VISL results in the retention of one VOC (trichloroethylene [TCE]). This change will be reflected in the text of Section 4.2.3.

53) Tables General - Please add a footnote to indicate that the target risk level for cancer is 1E-06 and for non-cancer the target hazard quotient is 0.1 for the screening levels.

A general note table with notes utilized throughout Data Summary Report tables and appendices is provided in the Data Summary Report at the start of Appendix A. An additional note indicating that the target risk level for cancer is 1E-06 and for non-cancer the target hazard quotient is 0.1 for the screening levels will be added to the general note table.

54) Tables General - Missing values – Soil– It is recognized that the valence state of chromium in soil at this site is not known. In COPC selection or for the initial comparison of site values to screening values, it should be conservatively assumed that all chromium is present as the hexavalent form, since this has a lower toxicity value than the trivalent form of chromium. It is also recognized that most chromium in soils tends to be in the trivalent form (ATSDR 2012). Therefore, for actual risk calculations, it may be appropriate to assume some fraction of the chromium in soil exists in the trivalent form, and the remaining fraction exists in the hexavalent form. Please add the appropriate screening values for hexavalent chromium to Table 8.

No hexavalent chromium is known to have been used in the aluminum manufacturing process (reduction process) or other processes onsite. Additionally, the process was a reduction process, and any metals present would be reduced to trivalent chromium. Therefore, hexavalent chromium is not expected to be present and thus, CFAC/Roux Associates does not believe that the existing data should be compared to screening levels for hexavalent chromium.

As a conservative measure, CFAC/Roux Associates will review the data collected during the Phase I Site Characterization after all four rounds of sampling is complete and the locations where the highest chromium concentrations were measured in soil and groundwater will be sampled for hexavalent chromium during the Phase II investigation.

55) Tables General – Water missing values – For groundwater, cadmium and manganese are missing. The cadmium (water) and manganese (non-diet) values presented in the EPA RSL table should be included. For surface water, cadmium and nickel are missing. The cadmium (water) and nickel (nickel soluble salts) values presented in the EPA RSL table should be included. Again, chromium (IV) values should be used for screening purposes.

Cadmium and nickel (soluble salts) will be added to tables and maps for groundwater and surface water. The May 2016 RSL table does not have a USEPA MCL listed for manganese (non-diet). As discussed in the response to the general comment on the tables above, chromium is not expected to be present in hexavalent form at the Site. To verify this is true, CFAC/Roux Associates will review the data collected during the Phase I Site Characterization after all four rounds of sampling is complete and the locations where the highest chromium concentrations were measured in soil and groundwater will be sampled for hexavalent chromium during the Phase II investigation.

56) Table 21 and Table 22 – Groundwater Statistics Versus Screening Levels – There is a mixture of total and dissolved fractions presented. Is this intentional? What is the rationale for this? What statistic is the fraction presented in the table associated with? Is it the maximum concentration?

Because human health standards are included for comparison purposes, it would be appropriate to only present statistics for the total fraction. It would be worthwhile performing a comparison of the total versus dissolved results to confirm the trend that the total fraction is greater than the dissolved fraction.

For all groundwater samples, metals analyses were only analyzed for "dissolved" fraction in accordance with the RI/FS Work Plan. During preparation of the RI/FS Work Plan, CFAC/Roux Associates proposed analyzing all groundwater and surface water samples for both "total" and "dissolved" metals. However, based on discussions between the project team (USEPA, MDEQ, CDM Smith, CFAC and Roux Associates), it was agreed that CFAC should only sample for dissolved metal fraction in groundwater samples. As such, the Tables 21 and 22 include total for fraction for all analyses besides metals.

Based upon the consensus discussion of the CFAC and EPA risk assessment personnel at the meeting on April 19, 2017, it is proposed that both "total" and "dissolved" analysis will be completed for metals, cyanide, and fluoride analysis during the Round 4 sampling event and summarized in the Groundwater and Surface Water Data Summary Report planned to be submitted in late 2017, following the Round 4 sampling event.

57) Table 23 – Surface Water Statistics Versus Screening Levels – Please confirm the fraction used to compute the summary statistics.

As described in the response to the prior comment, the surface water samples were only analyzed for total fraction, and thus the summary statistics are based on the total fraction.

58) Plates with Thematic Maps – Maps should be revised to include all screening levels, with symbols representing ranges that correspond with all screening levels. For example, as seen in Appendix N, Plate N1 (Cyanide and Fluoride in Soil) does not present the screening level for soil for the protection of groundwater. This is a global change that needs to be made to all thematic maps. The current presentation is misleading because it does not identify sampling locations that exceed the most conservative screening level. It is also recommended that the color scheme be revised such that green is not chosen to present results that exceed a screening level.

The color scheme will be modified on all thematic maps included in the Data Summary Report so that green dots always represent values less than the most conservative screening criteria.

For the soil and sediment thematic maps included in Appendix N and Z respectively, an additional dot will be added to the maps to represent values that exceed the most conservative screening level (i.e., Protection of Groundwater Risk Based Soil Screening Levels). The existing color scheme indicating exceedances of USEPA Industrial and Residential RSLs will remain.

For the groundwater and surface water thematic maps included in Appendix V and X, the ranges will be modified so that a green dot always represents values less than the most conservative screening criteria and a yellow dot always indicates an exceedance of the most conservative screening criteria. CFAC/Roux Associates believe that the ranges selected for the orange and red dots on the water maps should continue to vary per analyte because not all analytes have values for each criterion, and therefore each map should be tailored to the criteria that exist for each individual analyte.

It should be noted that some analytes do not have screening values (typically the general chemistry analytes). In such cases, CFAC/Roux Associates has selected a range that is appropriate for evaluating the range of data.

59) Appendix N and Z – Color Scheme for Comparison to Screening Levels – The established order for perceived level of potential risk is confusing because of a mixture of themes/comparisons for the various colored symbols. Currently, a result could fall into multiple categories and the severity of exceedances is lost when mixing screening levels in the categories. A suggested revision to the color codes is presented below for Appendix N (also applies to other appendices):

Blue – Analyte not detected
Green – < than the most conservative value
Yellow – > than the most conservative value (1-5x)
Orange – > than the most conservative value (6-10x)
Red – > than the most conservative value (>10x)

The relationship between residential and industrial values for each chemical is not linear, therefore, mixing the two screening levels and only evaluating the magnitude of exceedances in the color designation for one chemical is confusing. It is suggested that the color scheme be related to the exceedance magnitude for the most conservative screening level and other screening levels (as available) are presented as a frame of reference.

**A consistent presentation of MDLs in the appendices would be ideal. It would aid in the interpretation of detection limit adequacy. There should be a section in the text devoted to evaluating detection limit adequacy. Including limits here in the appendices would help tie it together.

The thematic maps will be revised as described in the response to the prior comment above. The planned revisions will address the use of the most conservative screening values on the thematic maps and will allow for clear indication of where there are exceedances of those most conservative values. The additional modifications to the color scheme ranges suggested in this comment would provide limited additional value now, in that it would not allow the reviewer to understand where there are exceedances of the various RSLs.

As described above in the response to the comment on Section 3.4.1, a new section will be added to the report summarizing and evaluating method detection limits.

60) Appendix V – Category Value Ranges – The ranges selected do not assist the reader in determining which samples are above or below the screening values presented. It cannot be deciphered which locations exceed the USEPA Tapwater RSL given the current designations for symbols. How do the blue and green dots differ?

As described in the response above, the maps in Appendix V will be modified so that a blue dot indicates non-detect, a green dot indicates a concentration lower than the most conservative screening value (i.e., typically the USEPA Tapwater RSL), and a yellow dot indicates a concentration above the most conservative screening value. The ranges represented by the orange and red dots will be modified based on the other existing screening criteria (i.e., USEPA MCLs/MDEQ DEQ-7 Standards) for each analyte, and therefore will be map specific.

61) Appendix V1 – the detection limit for cyanide presented in the dataset provided to USEPA is 10 μg/L, not 2 μg/L. Please confirm and correct as needed throughout the appendices. Fluoride (Appendix V2) does not look to be correct either. Presenting the correct detection limit is important in interpreting the data in terms of adequacy of the detection limit.

The detection limits provided in Appendix V are correct. The listed detection limits are the highest limits observed in all samples for each analyte. A summary and evaluation of all detection limits was added to the report in Section 3.8 as requested in the comment above regarding detection limits (Section 3.4.1).

62) Plates 7 through 10 – Geologic Cross-Sections – While these cross-sections present the generalized stratigraphy underlying the facility, they lack sufficient detail to assess the presence of any preferential pathways of groundwater transport. For example, the shallowest stratigraphic unit is presented as an undifferentiated 'fine to coarse sand with varying amounts of gravel and silt'. Each of these soil types should have been broken out (sand, silt, gravel) to better visualize the subsurface. As more data become available, the cross-sections should be updated with differentiated lithologic

units (i.e., gravel, sand, silt, clay) to more clearly assess the potential for preferential groundwater flow.

The geologic cross sections provided in the Phase I Data Summary Report are generalized to depict stratigraphy Site-wide and provide a general understanding of the hydrogeologic units that influence hydrogeologic conditions beneath the Site. The geologic cross-sections cover long distances across the Site. Additional geologic data will be collected during the Phase II investigation. As more data becomes available, the cross-sections will be updated with more detail where possible.

Additional data will also be collected Site-wide to evaluate groundwater flow. For example, pneumatic slug testing is proposed to be completed in Summer 2017, which should help assess the potential for preferential groundwater flow. This data will be summarized in the Groundwater and Surface Water Data Summary Report, which will be submitted in late 2017.

63) Plates 15 and 16 – Please review the comments above regarding Section 4.1.1 and Section 4.2.1 and revise the plates accordingly.

As described in the response to the comments above regarding Section 4.1.1. and 4.2.1, cyanide and fluoride concentrations observed during Round 1 of groundwater sampling near the West Landfill / Wet Scrubber Sludge Pond/ Drum Storage area are orders of magnitude higher than the locations downgradient. CFAC/Roux Associates feel this data preliminarily indicates that the landfills are the primary source. The variability of the concentrations in the center of the Site is acknowledged. These variations could potentially be related to groundwater flow direction, hydrogeology, and/or interaction of groundwater with nearby surface water features (i.e., the North-East Percolation Pond). CFAC/Roux Associates will continue to evaluate the iso-concentrations as additional rounds of data are collected. Additional evaluation of potential sources will be provided in the Groundwater Data Summary Report to be submitted after four rounds of sampling is completed.

References

ATSDR. 2012. Toxicological Profile for Chromium. September 2012. ATSDR Toxicological Profiles Web Site. http://www.atsdr.cdc.gov/toxprofiles/tp7.pdf